REMARKS

Claims 12, 14-24 and 26 are pending in the subject application. By the instant amendment, claim 12 is amended to more specifically recite the subject matter of the present invention. The amendments made to claim 12 introduce no new subject matter as the subject matter thereof may be found in the specification and figures as originally filed.

Claims 12, 14-24 and 26 are submitted to the Examiner for further consideration on the merits. In view of the preceding amendments and following remarks, favorable action on the merits is respectfully requested.

A. Introduction

An Amendment after Final Rejection in the subject application was filed with the United States Patent and Trademark Office on July 9, 2002, in response to an Office Action Made Final mailed on April 9, 2002. The Amendment of July 9, 2002 was not entered.

Applicants submit that the invention as claimed in claim 12 is patentably distinguished over the prior art references cited by the Examiner in the Office Action Made Final of April 9, 2002, for the following reasons:

B. The Fazan et al. Reference, U.S. Patent No. Re. 36,786

While the Fazan et al. reference teaches formation of conductive spacers, the spacers are different from those of the present invention in several ways. The spacers of the Fazan et al. reference are polysilicon; the spacers as recited in claim 12 of the present invention are tungsten containing spacers. The spacers of the Fazan et al. reference are not formed from a tungsten containing conductive layer that is formed in first and second via holes, which are formed in an interlevel insulating layer; the spacers as recited in claim 12 of the present invention are formed from a tungsten containing conductive layer that is formed in first and second via holes, which

are formed in an interlevel insulating layer. The spacers of the Fazan et al. reference have an oxide 15, in which the conductive spacers are formed, removed from around the spacers, and an HSG silicon layer 31 is deposited on the spacers; the spacers as recited in claim 12 of the present invention do not have the interlevel insulating layer removed from around the spacers, and a dielectric layer is deposited on the spacers. Furthermore, there is no second via hole in the Fazan et al. reference.

The tungsten containing conductive layer is selectively etched to simultaneously form the tungsten containing conductive spacers and the tungsten containing conductive plug in the present invention. There is no tungsten containing conductive layer to etch in the Fazan et al. reference.

Furthermore, in claim 12 of the present invention, the first and second via holes are formed in the same interlevel insulating layer, the first via hole having sidewalls and disposed above the lower electrode, and the second via hole disposed above the first wire line. A tungsten containing conductive layer is formed on the interlevel insulating layer and in the first and second via holes, and is then selectively etched to simultaneously form a tungsten containing conductive sidewall spacer in the first via hole and on the sidewalls of the first via hole for preventing dielectric disconnection, and a tungsten containing conductive plug in the second via hole. This differs from the Fazan et al. reference, in which the only conductive plug is one on which the conductive spacers are formed.

The Gambino et al. Reference, U.S. Patent No. 6,166,423

The Gambino et al. reference does not teach or mention forming tungsten containing conductive sidewall spacers for preventing dielectric disconnection in a via hole that is formed in an interlevel insulating layer, the spacers being formed from a tungsten containing conductive layer

formed in the first via hole and on sidewalls of the first via hole, as recited in claim 12 of the present invention. In the Office Action Made Final of April 9, 2002, the Examiner stated:

> It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the etching back of a conductive layer of Fazan to form the conductive spacers in the first via hole of Gambino in order to maximize the area of a capacitor electrode.

Office Action of April 9, 2002, at p. 3.

Because the spacers of the Fazan et al. reference are not formed in a first via hole formed in an interlevel insulating layer and formed from a tungsten containing conductive layer formed in the first via hole and on sidewalls of the first via hole, and because the spacers of the Fazan et al. reference are covered by HSG silicon, the combination of the Fazan et al. reference and the Gambino et al. reference does not render obvious claim 12 of the present invention, which recites in part:

> performing a tungsten etch back process to selectively etch back the tungsten containing conductive layer on the interlevel insulating layer and in the first and second via holes to simultaneously form: (i) a tungsten containing conductive sidewall spacer from the tungsten containing conductive layer formed in the first via hole and on the sidewalls of the first via hole for preventing dielectric disconnection; (ii) a tungsten containing conductive plug from the tungsten containing conductive layer formed in the second via hole, the tungsten containing conductive sidewall spacer and the tungsten containing conductive plug being formed of the same tungsten containing conductive layer; and (iii) an exposed surface containing the spacer, conductive plug, the predetermined surface of the lower electrode, and predetermined surfaces of the interlevel insulating layer;

Because neither the Fazan et al. reference nor the Gambino et al. reference teach a tungsten containing conductive spacer, a tungsten containing conductive layer or a tungsten containing conductive plug, the Examiner relies on the Hayden reference for the use of sidewall spacers formed from a tungsten containing material.

The Hayden Reference, U.S. Patent No. 5,498,889

The Hayden reference, however, teaches spacers formed of tungsten polycide, e.g., the tungsten is deposited on polysilicon. In claim 12 of the present invention, the tungsten containing conductive spacer is not formed on polysilicon, which precludes the tungsten containing conductive spacer of claim 12 of the present invention from being formed of tungsten polycide. As previously noted, the tungsten containing conductive spacer of the present invention as recited in claim 12 is formed in a first via hole formed in an interlevel insulating layer, not in a polysilicon layer as taught by the Hayden reference.

Furthermore, the capacitor structure of the Hayden reference is completely different from that of the present invention. The spacers of the Hayden reference are not intended to solve a dielectric layer disconnection problem as in the present invention. In the Hayden reference, the conductive spacer 32 is not formed on top of a predetermined surface of a lower electrode, as recited in claim 12 of the present invention.

Because the spacers of the Hayden reference are formed on polysilicon, and because they are not formed on a lower electrode, unlike the spacers as recited in claim 12 of the present invention, and further because of the differences between the Fazan et al. reference and the Gambino et al. reference, it is submitted that a combination of these three prior art references does not render obvious the present invention as claimed in claim 12.

In view of the differences between the present invention as claimed in claim 12 and the cited prior art references, it is believed that claim 12 of the present invention is patentably distinguished over the cited prior art references, and a notice to such effect is respectfully requested.

Additionally, because claims 14-24 and 26 depend from claim 12, either directly or indirectly, it is believed that claims 14-24 and 26 are allowable as depending from an allowable base claim. Therefore, favorable action on claims 14-24 and 26 is respectfully requested.

E. Conclusion

It is submitted that claims 12, 14-24 and 26, are in condition for allowance, and a notice to such effect is respectfully requested.

Finally, if the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendment and remarks, an early and favorable action on all of the pending claims is earnestly solicited.

Respectfully submitted,

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